

What is claimed is:

1. An antenna duplexer comprising:

i) a transmitter surface acoustic wave (SAW) filter;

5 ii) a phase shift circuit whose one port is electrically connected with
an output port of the transmitter SAW filter; and

iii) a receiver SAW filter whose input port is electrically connected
with remaining one port of the phase shift circuit,

wherein the transmitter and receiver SAW filters have different
frequency bands, providing attenuation with each other,

10 the phase shift circuit i) shifts a phase of the receiver SAW filter in its
transmitter-band; and ii) has a phase angle and a characteristic impedance with
which a magnitude of a reflection coefficient at a center frequency in the
transmitter-band of receiver SAW filter is to be not less than 0.8 and the phase
angle of reflection coefficient at a center frequency in the transmitter-band of
15 receiver SAW filter is to be from 0° to 45° .

2. The antenna duplexer of claim 1, wherein the phase shift circuit has a
less-than-50 ohm characteristic impedance.

20 3. The antenna duplexer of claim 2, wherein the characteristic impedance
of the phase shift circuit takes 42 ± 8 ohms excluding 50 ohms.

4. The antenna duplexer of claim 1, wherein the transmitter SAW filter is
a ladder-type filter, in which a resonance frequency of a serial-branch SAW
25 resonator is higher than an anti-resonance frequency of a parallel-branch SAW
resonator.

5. The antenna duplexer of claim 1, wherein the phase angle of the phase shift circuit takes $90 \pm 10^\circ$.

6. The antenna duplexer of claim 1, wherein the characteristic impedance
5 of the phase shift circuit takes 42 ± 8 ohms excluding 50 ohms, and the phase angle of the phase shift circuit takes $90 \pm 10^\circ$.

7. An antenna duplexer comprising:

a transmitter surface acoustic wave (SAW) filter;

10 a phase shift circuit whose one port is electrically connected with an output port of the transmitter SAW filter; and

a receiver SAW filter whose input port is electrically connected with remaining one port of the phase shift circuit,

wherein the transmitter and receiver SAW filters have different pass
15 bands and attenuate the other pass band with each other.,

the phase shift circuit i) shifts a phase of the receiver SAW filter in its transmitter-band; and ii) has a less-than-50 ohm characteristic impedance.

8. The antenna duplexer of claim 7, wherein the characteristic impedance
20 of the phase shift circuit takes 42 ± 8 ohms excluding 50 ohms.